



Defense Information Systems Agency

Department of Defense



JSC Ordnance Electromagnetic Environmental Effects (E3) Risk Assessment Database (JOERAD)

**Joint Spectrum
Center
E3 Division (J5)
(410) 293-9264**



Disclaimer



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- **Joint Spectrum Center**
Who we are
Warfighter Support
- **JOERAD Beginning**
- **JOERAD**
- **Requirements**
- **JOERAD how it works**

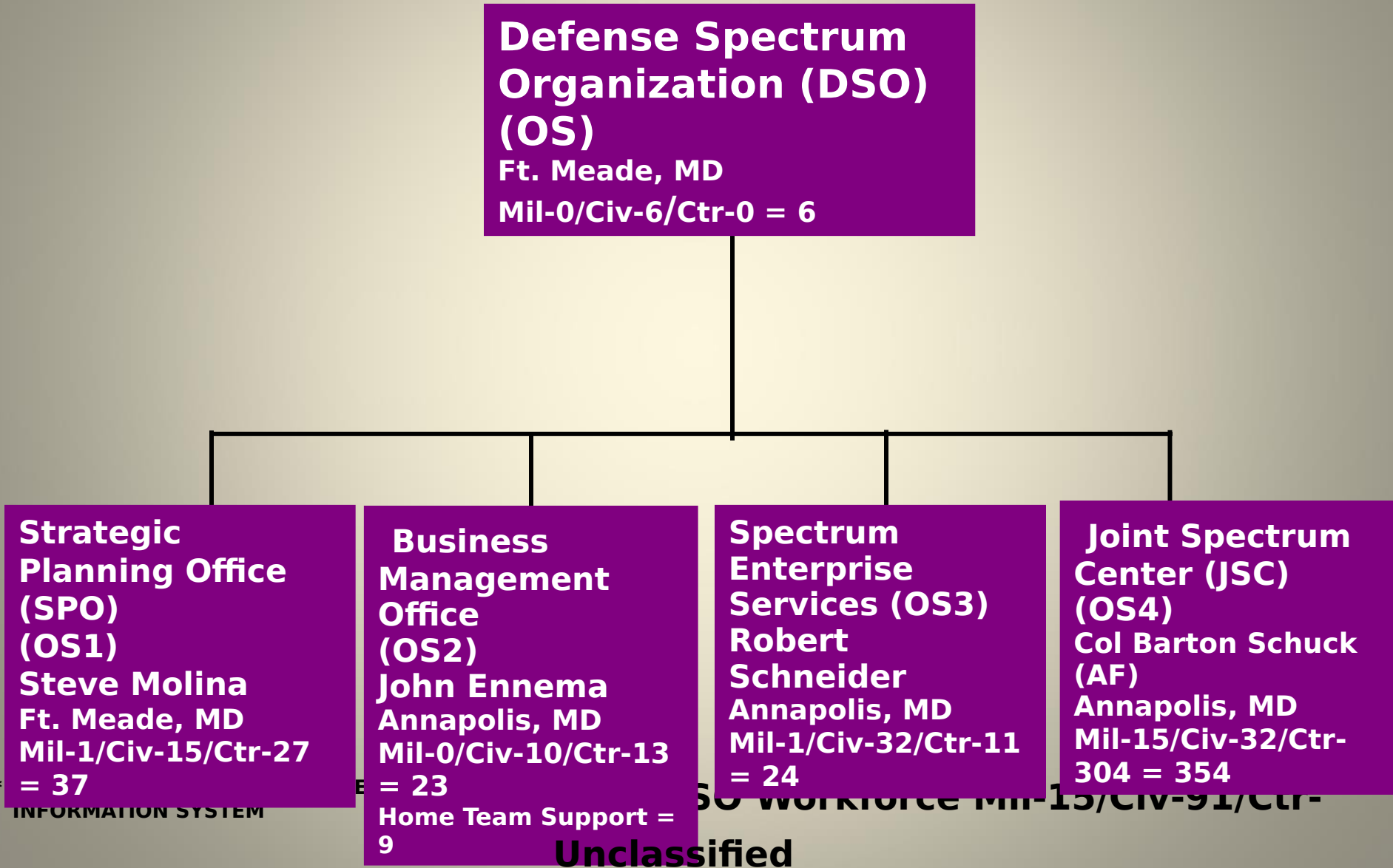
- **Training**
- **Integration**
 - **School(s)**
 - **Course(s)**
 - **Material**
- **HERO Incident Reporting Form**
- **JOERAD Demo**

Who we are

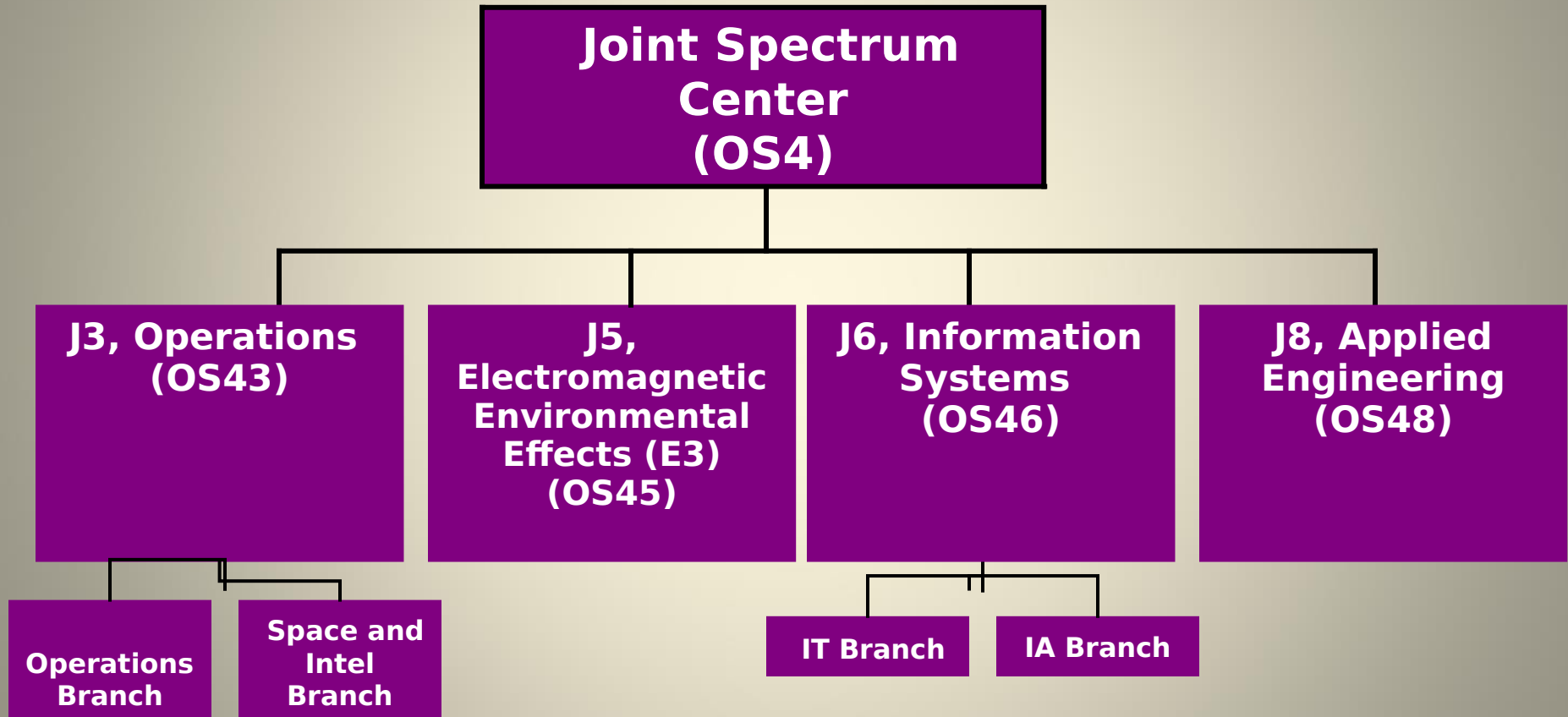
**The JSC is the DoD Strategic Resource
for EM Spectrum Expertise.**

DSO

Current Structure



JSC Organization





Joint Spectrum Center and JOERAD



The Joint Spectrum Center is the Program Lead for the development and support of JOERAD.

**The JSC is the DoD Strategic Resource
for EM Spectrum Expertise.**

JSC provides :

➤ Warfighter Support

➤ Spectrum Information Management

➤ Acquisition Support

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decompressor
are needed to see this picture

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decompressor
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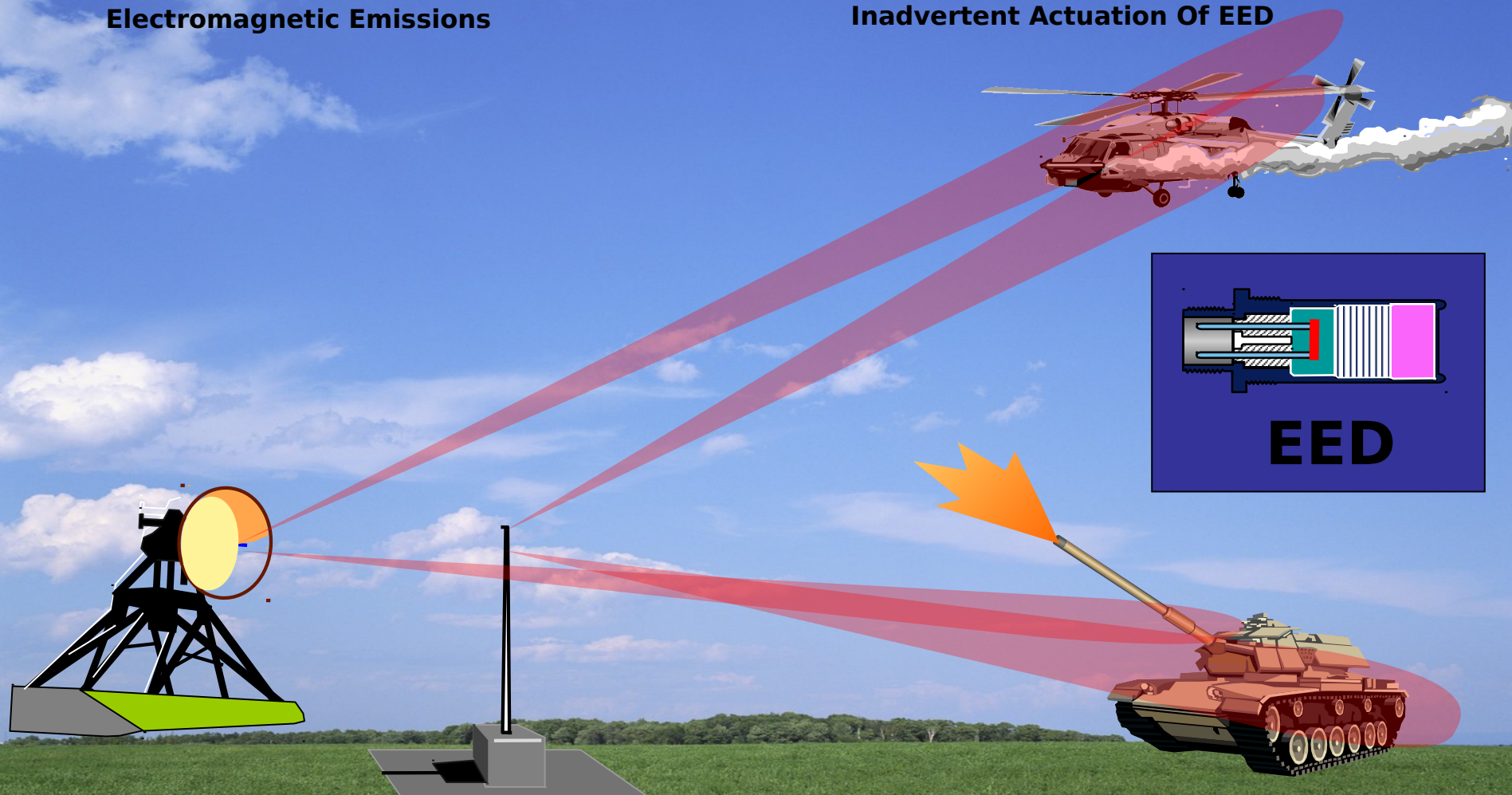


CAUSE

Electromagnetic Emissions

EFFECT

Inadvertent Actuation Of EED



Countering the Global Threat - Operational Activity

198

Grenada



1991

Gulf War



199

Haiti



200

Iraq



Increased Shipboard Operations

198

Panama



199

Somalia



200

Afghanistan



200

4



Use of Joint and Combined **INTEGRATED** military operations increases the chances for incidents of interference/conflicts



HERO CONTROL AND THE JOINT OPERATIONS CHALLENGE



- **Technological advances**
 - ♦ powerful communication and radar equipment that radiate high levels of EM energy
- **Sensitive, low-power EEDs/EIDs**
- **HERO control**
- **Service Programs adequately address the hazards associated with their operational EMEs**
- **Service ordnance (Army, Air Force, etc.) may not be tested or designed for the joint integrated EME hazard**
- **Currently the most restrictive emission control condition is the only accepted means of**





JSC ORDNANCE E3 RISK ASSESSMENT DATABASE



***JOERAD provides
Operational Commanders
and Planners the
information:***

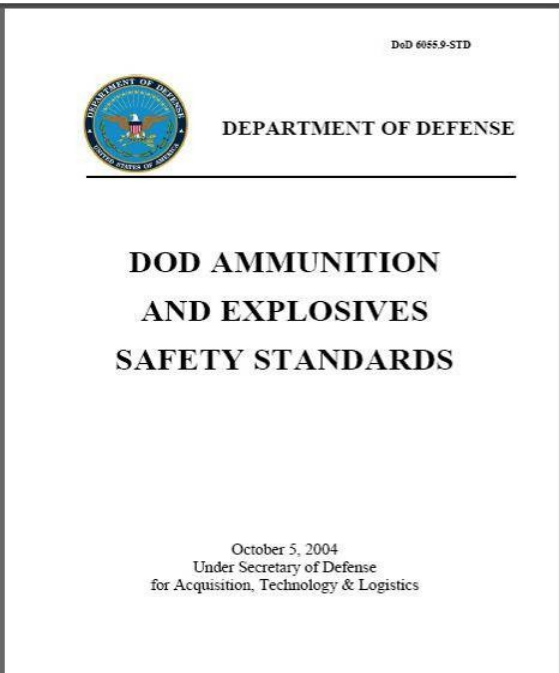
- to **SAFELY** and **EFFICIENTLY** manage the conflict between ordnance and radio frequency (RF) emitters employed in an Integrated Joint Operation/ Exercise

Applications:

- ☐ Embarking forces (Marines, Army, Air Force or NATO) on Navy ships
- ☐ Army Rotary Wing aircraft on Navy ships
- ☐ SOF/Conventional forces aboard Service aircraft

DODD 6055.9M

DOD AMMUNITION AND EXPLOSIVES SAFETY STANDARDS



V2.E3.7.1.3. All data from HERO evaluations shall be compiled in a centralized data repository to support the Joint Spectrum Center Ordnance Electromagnetic Environmental Effects (E3) Risk Assessment Database (JOERAD), for subsequent use in information applications supporting the DoD Components.

V2.E3.7.2. The DoD Components shall take measures (e.g., identifying susceptibilities, quantifying EME's, evaluating risks associated with operating procedures, and establishing tailored emission control instructions) to ensure that HERO effects on military munitions are resolved during the planning of joint or combined operations or training exercises.



DIRECTIVE



Joint Shipboard Helicopter Operations 3-04

ENVIRONMENT CONCERN

JSHO require US Army, US Air Force, and special operations personnel operate alongside US Navy (USN), US Marine Corps (USMC), and US Coast Guard (USCG) personnel in unfamiliar work and electromagnetic environment

WHERE TO GO

When the Navy's HERO EMCON bill does not address the operational concerns on non-Navy ordnance aboard ship, the JSC's ordnance E3 risk assessment database **(JOERAD) should be consulted for assistance.**

The negative effects of shipboard transmitters is known and documented in EMV reports, but these are not published in an operator friendly format; however this information is contained in **JOERAD, to provide complete E3 information for the embarked unit and the ship's company.**



DIRECTIVE (Cont.)



Joint Shipboard Helicopter Operations 3-04 Predeployment Planning Checklists

Non-Navy ordnance aboard Navy ships is one of the most critical issues facing joint ship helicopter operations and must be addressed (and solved) early by joint planners. Direct liaison between the planner, embarking unit ordnance officer and ship's company weapon's department will solve many of these compatibility, procedures, and training issues so that few remain for the pre-deployment conference.

- **Introduced Ordnance and/or Emitters/Joint Ops**
 - Provides immediate HERO guidance
 - Portable & Mobile Transmitters



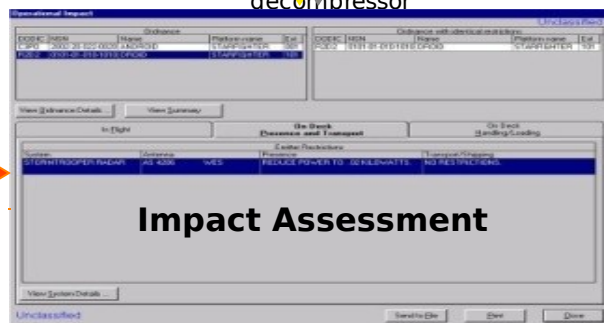


JOERAD How it works!!

Unit/Platform Module

Unit/Platform Module

QuickTime™ and a decompressor are needed to see this picture.



QuickTime™ and a decompressor are needed to see this picture.

Ordnance Module





JOERAD is a risk assessment tool that can be used to mitigate the risk of introducing ordnance into complex DoD Electromagnetic Environments.

JOERAD

JSC Ordnance E3 Risk Assessment Database



Impact Analysis



View/Manage Data



Change Password



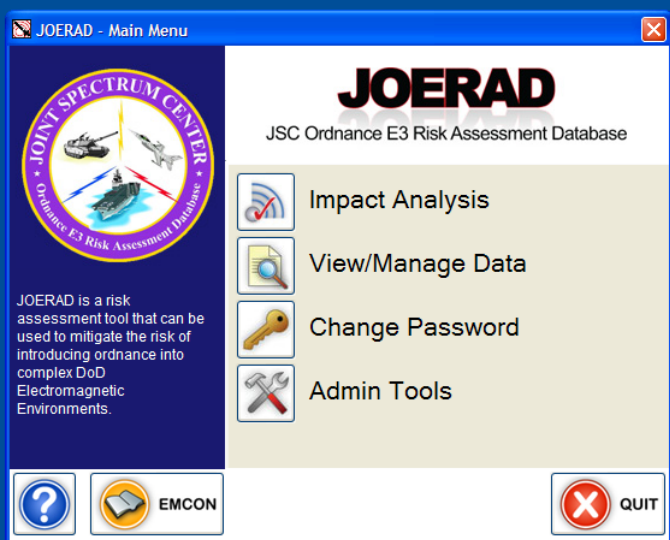
Admin Tools

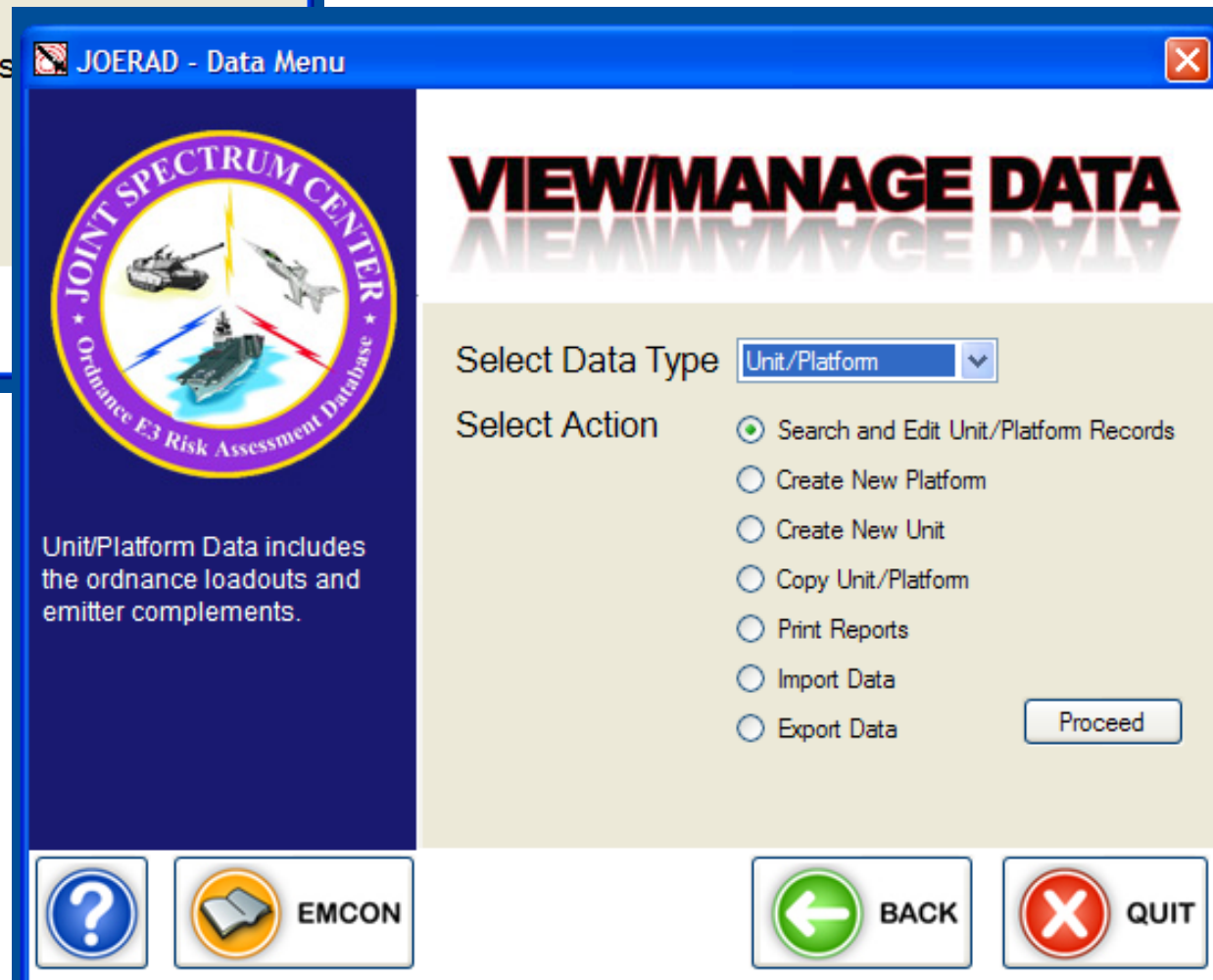
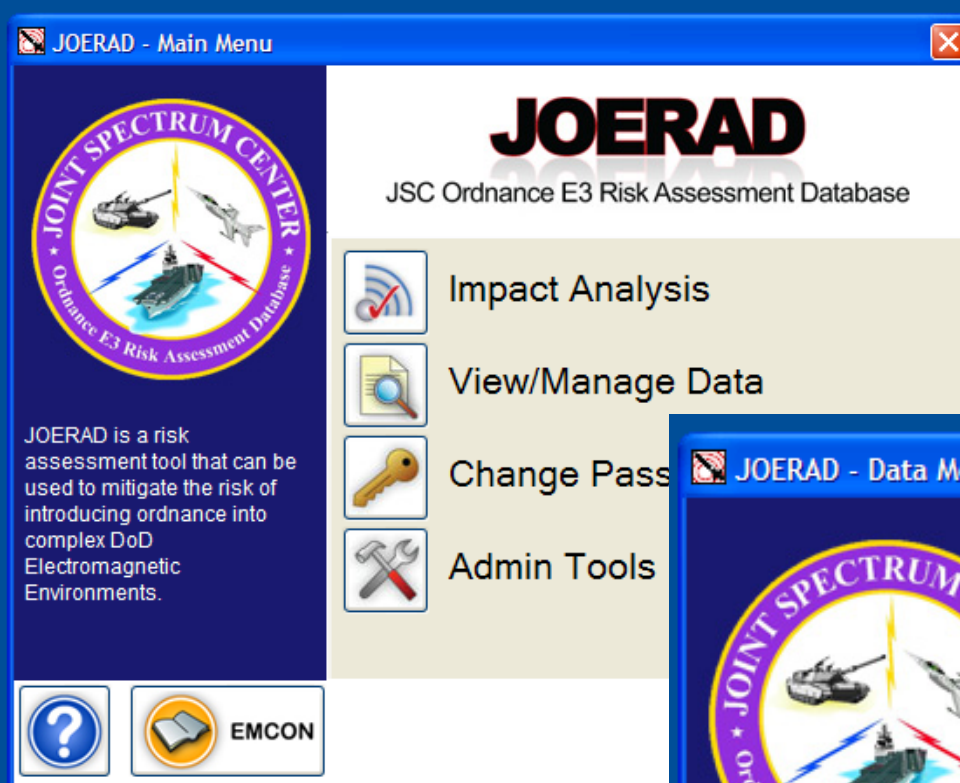


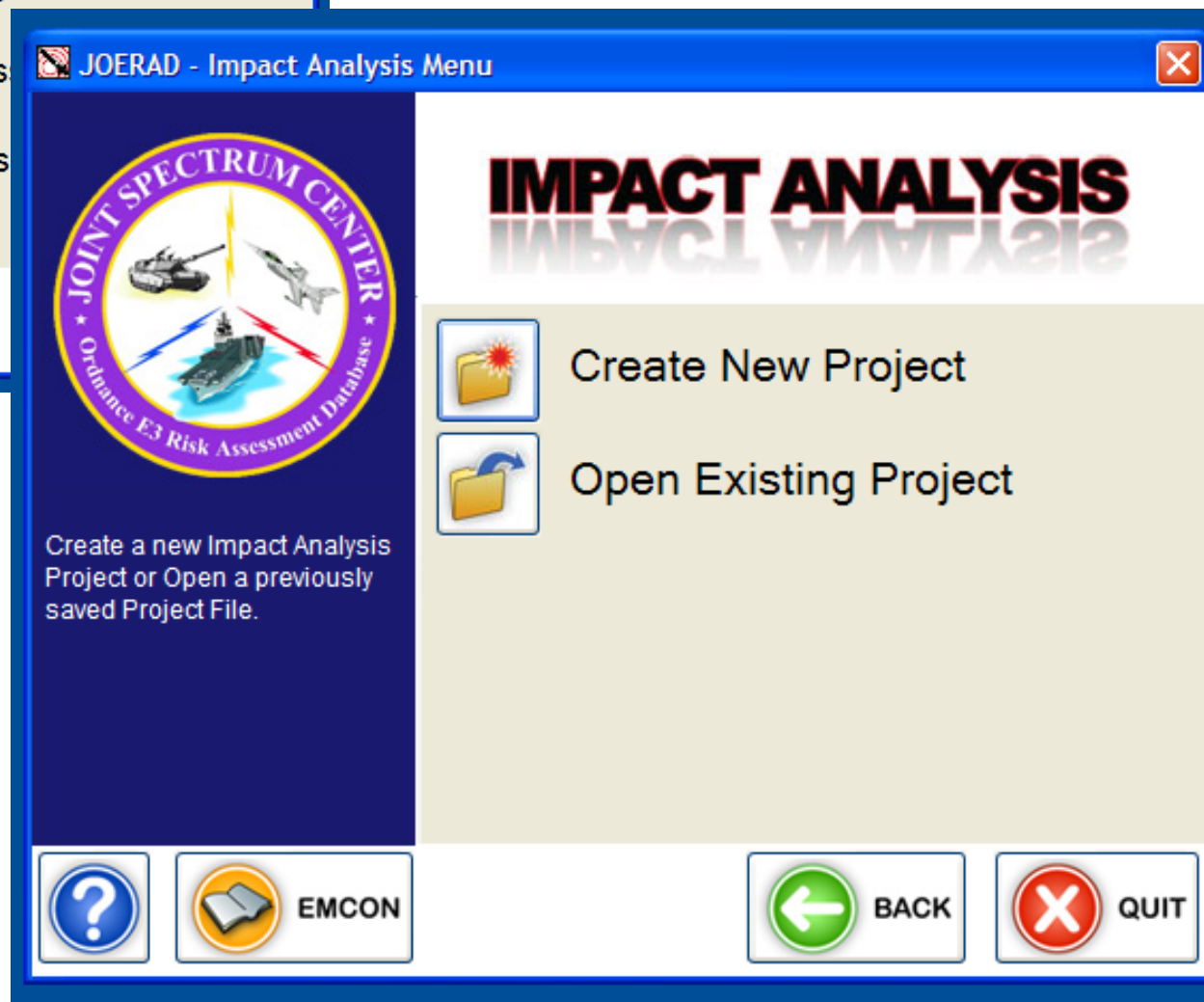
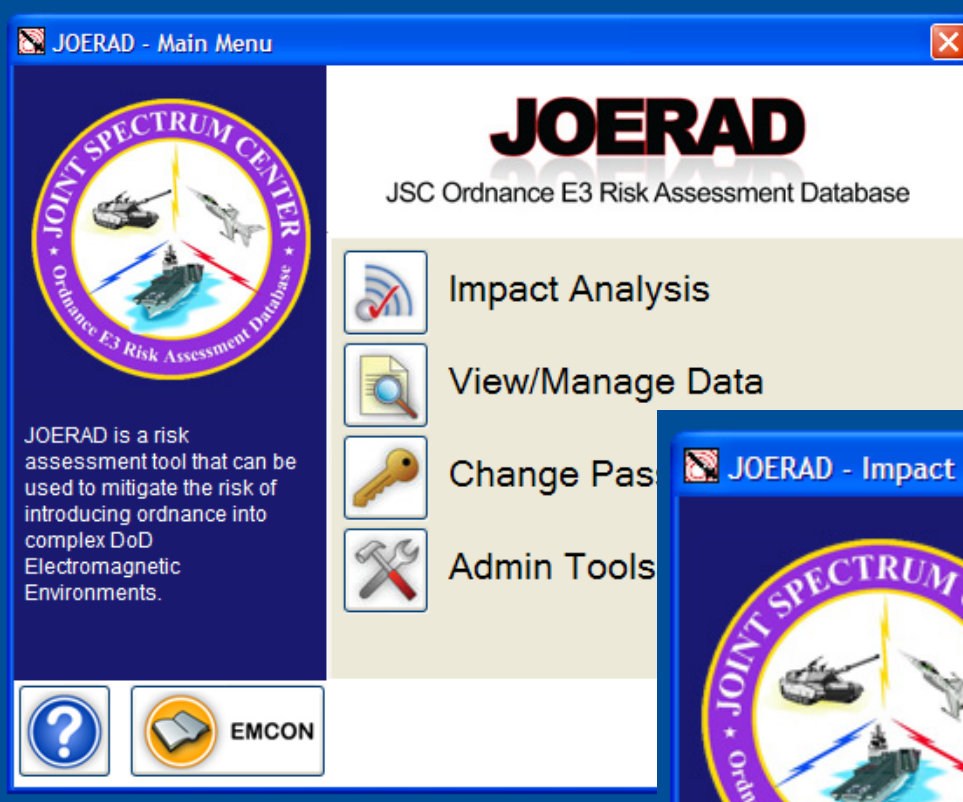
EMCON



QUIT







JOERAD - Impact Analysis - Project Defaults

Help

Unclassified

Project Defaults

Emitters

Emitter Summary

Unit Platform/
Vulnerability List

Ordnance

Ordnance Summary

Build Project

Edit Project

Run Analysis



Select the Host Environment and enter the default parameters for the Impact Analysis.

Enter up to three lines of text that will be added to each page of printed reports.

SOAR 160TH ONBOARD USS GEORGE WASHINGTON DEMO ONLY

Select Host Environment

Host Unit or Platform Type/Class: CV/CVN

Search...

Unit/Platform Name: USS GEORGE WASHINGTON CVN 73 N21412

Edit the minimum standoff distance defaults for the project.

Note: Minimum standoff distances for individual emitters can be entered in the Edit Project phase of the Impact Analysis . The project default distances will be applied when an individual standoff has not been specified.

In-Flight Distance (ft.): 150 On-Deck Distance (ft.):* 10

*On Deck distance default will apply only to HF, handheld, land mobile and manpack emitters.

Warning: JOERAD will not report potential conflicts for ordnance placed closer than the minimum standoff distance.

 EMCON

Cancel

Next



Unclassified

Project
Defaults**Emitters**Emitter
SummaryUnit Platform/
Vulnerability List

Ordnance

Ordnance
SummaryBuild
ProjectEdit
ProjectRun
Analysis

Add any additional Emitters that should be included in the analysis by clicking the Emitter Search button and querying the Equipment Characteristics Database.

Build Additional Emitter List

Add additional emitters. Press <Emitter Search> to identify existing emitters.

	Emitter Nomenclature	Antenna Nomenclature
*		

Remove Emitter

Emitter Search

Show Details



Save Project

Cancel

Back

Next

Finish

Impact Analysis Wizard

Help

UNCLASSIFIED

Project Defaults

Emitters

Emitter Summary

Unit Platform/
Vulnerability List

Ordnance

Ordnance Summary

Build Project

Edit Project

Run Analysis



View all Emitters included in the analysis. Highlight an Emitter and click the Show Details button for more information.

Emitter Summary

The following emitters have been selected for analysis based on prior Unit/Platform or Equipment selections. To exclude from analysis, uncheck the emitter.

USS GEORGE WASHINGTON CVN 73

☒

☒

AN/GRT-21 (M) 1

☒

☒

AN/PRC-114 (M)

☒

☒

AN/PRC-77

☒

☒

AN/PRC-90

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AN/PRQ-7

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AN/PRQ-7

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AN/PRQ-7

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AN/PRQ-7

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AN/PSC-2

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AN/SPN-43B

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AN/SPN-43C

SYL

Show Details



Save Project

Cancel

Back

Next

Finish

Impact Analysis Wizard

Help

UNCLASSIFIED

Project Defaults Emitters Emitter Summary **Unit Platform/Vulnerability List** Ordnance Ordnance Summary Build Project Edit Project Run Analysis

Select any additional Victim Units or Platforms that should be included in the analysis by first selecting a Snapshot, then a Platform Type, and then a Platform. To search for Units/Platforms in the database, click the Unit/Platform Search button.

Build Unit/Platform Vulnerability List

Select unit and/or platform to identify ordnance and victim equipment. Press <Unit/Platform Search> to identify available units or platforms.

	Snapshot	Platform Type	Unit/Platform Selected
▶	SOAR 160	Unit	(U) 160TH SPECIAL OPERATIONS AVIATION
*			

Remove

Unit/Platform Search

Note: Do not use the drop down lists when selecting ground units/platforms, use the Unit/Platform Search command instead.

Save Project

Cancel

Back

Next

Finish

Unclassified

Project
Defaults

Emitters

Emitter
SummaryUnit Platform/
Vulnerability List

Ordnance

Ordnance
SummaryBuild
ProjectEdit
ProjectRun
Analysis

Add any additional Ordnance that should be included in the analysis by clicking the Ordnance Search button.

Build Additional Ordnance List

Add additional ordnance. Press <Ordnance Search> to identify ordnance.

	DODIC	NSN	Platform Description	Ext	Cls
▶	M104	1375-00-529-852	NP-EID	001	U
*					

Remove Ordnance

Ordnance Search

Show Details



Save Project

Cancel

Back

Next

Finish

Impact Analysis Wizard

Help

UNCLASSIFIED

Project Defaults

Emitters

Emitter Summary

Unit Platform/ Vulnerability List

Ordnance

Ordnance Summary

Build Project

Edit Project

Run Analysis



View all Ordnance included in the analysis. Highlight an item and click the Show Details button for more information.

Introduced Ordnance Summary

The following ordnance and/or victim equipment have been selected for a vulnerability assessment based on prior Unit/Platform or Equipment selections. To exclude from analysis, uncheck the equipment.

☒ 

160TH SPECIAL OPERATIONS AVIATION

☒ **Ordnance**

☒  A546 - 1305-00-555-4065 - MH-6M -

☒  B125 - 1305-01-081-3341 - AV-8A - 0

☒  HA07 - 1340-01-424-5819 - NP-EID -

☒  MD73 - 1377-01-049-6365 - MH-60K

☒  PC91 - 1410-01-227-9468 - MH-60R -

☒  PC91 - 1410-01-227-9468 - MH-60S

☒  PJ02 - 1425-01-024-9982 - OH-58D -

Show Details



Save Project

Cancel

Back

Next

Finish

Impact Analysis Wizard

Unclassified



Project Defaults Emitters Emitter Summary Unit Platform/Vulnerability List Ordnance Ordnance Summary Build Project Edit Project Run Analysis

Build Project

Building Project Antenna Modes ...



Cancel



View all Ordnance
the analysis.
item and click
Details button
information.



Save Project

Cancel

Back

Next

Finish



Unclassified

Project
Defaults

Emitters

Emitter
SummaryUnit Platform/
Vulnerability List

Ordnance

Ordnance
SummaryBuild
ProjectEdit
ProjectRun
Analysis

You may click the Next button to Edit the Project or click the Finish button to complete the analysis.

Build Successful!

Click Next to Edit the Project.

Click Finish when you are ready to run the Impact Analysis.

Review Data
Deficiencies



Save Project

Cancel

Back

Next

Finish



Unclassified

Project
Defaults

Emitters

E
Su

ct

Edit
ProjectRun
Analysis

Select the Host Environment
and enter the default
parameters for the Impact
Analysis.

Analysis Results

File EMCON Library

Select item to view.

- ☒ HERO Results
 - Operational Impact
 - Detailed Results
 - HERO Ordnance Matrix
 - HERO Condition Matrix
 - Project Emitters
 - Project Ordnance
 - Equipment to Ordnance
- ☒ Deficiency Report
 - Data Deficiencies

View

Print

Close

page of printed reports.

Search...

87

ject.

ers can be entered in the Edit
default distances will be
ot been specified.

nce (ft.):* 25

and mobile and manpack

tial conflicts for
n standoff distance.



EMCON

Cancel

Next



SAMPLE RESULTS



OPERATIONAL IMPACT REPORT

Operational Impact

Help

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Ordnance			
DODIC Name	NSN	Platform	Ext
B125	1305-01-081-3341	AV-8A	001
30MM CARTRIDGE			
HA07	1340-01-424-5819	NP-EID	001
2.75 INCH ROCKET MOTOR			
MD73	1377-01-049-6365	MH-60K	002
IMPULSE CARTRIDGE			
PC91	1410-01-227-9468	MH-60R	001
HELLFIRE			



Ordnance with the same restrictions			
DODIC Name	NSN	Platform	Ext

View Summary

View Ordnance Details

View Eqp To Ord

View System Details

OD Immediate Post-Launch HB Staged HB Handling/Loading & Platform Loaded

IF Transportation/Storage. & Platform Loaded IF Immediate Post-Launch OD Transportation/Storage & Staged OD Handling/Loading & Platform Loaded

System Antenna	In Flight Emitter Restrictions	
	Transportation/Storage	Platform Loaded
AN/PRC-77	NO RESTRICTIONS.	NO RESTRICTIONS.
AT-271 /PRC		
AN/SPN-43B	SILENCE WITHIN 1926 FT.	SILENCE WITHIN 1926 FT.
AS-2785/SPN-43A		
AN/SPN-43C	SILENCE WITHIN 1752 FT.	SILENCE WITHIN 1752 FT.
AS-2785/SPN-43A		
AN/SPQ-9B	SILENCE WITHIN 7538 FT.	SILENCE WITHIN 7538 FT.
ZZ/SPQ-9B (BASELINE)		
AN/SPQ-9B	MISSING DATA - UNABLE TO	MISSING DATA - UNABLE TO



ORDNANCE CONDITION



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USS GEORGE WASHINGTON CVN 73 N21412 JOINT OPERATION ORDNANCE MATRIX

PROJECT NAME: SOAR 160TH ONBOARD USS GEORGE WASHINGTON DEMO ONLY

PROJECT DATE: March 22, 2010

Ordnance ID	Ordnance Name	Location	S4 Phase	EMCON Condition
PC91 1410-01-227-9468 MH-60R	HELLFIRE	On Deck	Transport./ Storage	0
			Staged	0
			Handling/ Loading	J03
			Platform Loaded	0
			Immediate Post-Launch	0
		Hangar Bay	Staged	0
			Handling/ Loading	0
			Platform Loaded	0



Condition Matrix



UNCLASSIFIED SPECIAL HANDLING

USS GEORGE WASHINGTON CVN 73 N21412 JOINT OPERATION CONDITION MATRIX

PROJECT NAME: SOAR 160TH ONBOARD USS GEORGE WASHINGTON DEMO ONLY

PROJECT DATE: March 22, 2010

HERO CONDITION	EQUIPMENT	REQUIREMENTS
J03	Apply the following procedures for helicopters in-flight and on-deck.	
	AN/URC-131B(V) Deck Edge Antennas (within 98 feet)	SILENCE
	Island Antennas	250W
	AN/URC-131C(V) Deck Edge Antennas (within 120 feet)	SILENCE
	Island Antennas	250W



BENEFITS

- **No-Cost Organic asset**
- **Adaptable to dynamic operational situations**
- **Warfighter can make informed decisions PRIOR to deployment**
- **Analyze hypothetical operational scenario**
 - **“What if...?”**

DISA JOERAD REQUEST



- **CD:**

To obtain JOERAD software, contact JSC (J5) at Commercial (410) 293-9264, or request online at: acc.dau.mil/joerad and filling out the software request form. JOERAD is available to U.S. Military, U.S. Government, and supporting contractors.



Technology that today's fighting forces require

Request online at:
acc.dau.mil/joerad



JOERAD Software Request Form - Contractor

JOERAD Software Request Form - Government



JOERAD TRAINING



Training is schedule for one day.

- Students must have **Secret** clearance.
- Training can be brought to the end-user, classroom location in the **Norfolk** area, with future locations at **San Diego**.
- **TRAINING:**
To request JOERAD training contact
JOERAD Training Staff, 757-692-4590



HERO Incident Reporting Form site:
<https://acc.dau.mil/forms>

**Program Manager
Joint Spectrum Center
RD&A Division (J5)
(410)293-9264**

**JOERAD Instructor
EMC Management Concepts
(757) 692-4590**



QUESTIONS



www.disa.mil



- **BACK UP SLIDES**



Joint Spectrum Center Missions



WARFIGHTER SUPPORT

- Deployable spectrum management (SM) for operations
- On-call interference resolution support
- Support Info Ops/Special Technical Ops (IO/STO) and Electronic Warfare
- Hazards of Electromagnetic Radiation on Ordnance (HERO) assessments
- Provide regional Electromagnetic Environment (EME) data to support deployments
- Manage Joint Service Ordnance Electromagnetic Environmental Effects (E3) Program
- Battlefield SM Training

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decompressor
are needed to see this picture.



Joint Spectrum Center Missions



Spectrum Information Management

- Collection and maintenance of SM, E3, and HERO data
- Development of DoD E3 technical standards (Lead Standardization Activity)
- Operate and Maintain the DoD Frequency Resource Record System (FRRS)
- Provide SM and E3 training
- Maintenance of SPECTRUM XXI (**National Standard** Joint frequency assignment tool used in support of Joint Operations)



Joint Spectrum Center Missions



Acquisition Support

- Provide Electromagnetic Compatibility (EMC) analyses, on a reimbursable basis, to DoD Agencies, Federal Agencies and Industry
- Provide E3 Assessments for DoD **acquisition** & **test** communities
- Review requirements and acquisition documents for SM and E3 adequacy
- Measurement and testing support





Joint Spectrum Center Missions



Research and Development

- Spectrum Management and E3 information systems development
- Modeling and Simulation development
- EMC analytical tools development
- Research spectrum efficient technologies
- Develop analytical algorithms



- **School(s)**
- **Course(s)**
- **Material/Delivery**
- **Milestones**



Joint Spectrum Center Missions



Warfighter Support

- Manage Joint Service Ordnance Electromagnetic Environmental Effects (E3) Program
- Hazards of Electromagnetic Radiation on Ordnance (HERO) assessments
- Support Info Ops/Special Technical Ops (IO/STO) and Electronic Warfare

Spectrum Information Management

- Collection and maintenance of SM, E3, and HERO data
- Provide SM and E3 training
- Operate and Maintain the DoD Frequency Resource Record System (FRRS)

Acquisition Support

- Provide E3 Assessments for DoD **acquisition** & **test** communities
- Review requirements and acquisition documents for SM and E3 adequacy
- Measurement and testing support

Research and Development

- EMC analytical tools development
- Modeling and Simulation development
- Research spectrum efficient technologies

Provides direct support to Combatant Commanders and DoD Components to enable effective and efficient use of the electromagnetic spectrum and control of electromagnetic environmental effects in support of national security and military objectives.